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What is claimed is:

1. A beam parameter monitoring unit for coupling with a molecular fluorine (F2) or ArF laser resonator that produces an output beam having a wavelength below 200 nm, comprising:

an uncoated beam splitter formed of substantially material transparent to radiation having said wavelength below 200 nm disposed to reflect a portion of the radiation in the output beam;

a detector for measuring at least one optical parameter of the output beam portion reflected by the uncoated beam splitter; and

a beam path enclosure containing said uncoated beam splitter and having an interior prepared such that an optical path of said beam portion through said enclosure from said laser resonator to said detector via said reflection by said beam splitter is substantially free of photoabsorbing species that substantially photoabsorb radiation of said wavelength below 200 nm so that the beam portion reflected by said beam splitter reaches said detector without substantial attenuation from said photoabsorbing species.

2. The beam parameter monitoring unit of Claim 1, wherein said substantially transparent material of said uncoated beam splitter includes CaF_2.

3. The beam parameter monitoring unit of Claim 1, wherein said substantially transparent material of said uncoated beam splitter includes MgF_2.

4. The beam parameter monitoring unit of Claim 1, wherein said detector is disposed within a detector enclosure that is sealably coupled with said beam path enclosure for maintaining an interior of said detector enclosure substantially free of said photoabsorbing species.

5. The beam parameter monitoring unit of Claim 4, wherein said detector enclosure comprises one or more ports for purging said detector enclosure

with an inert gas to maintain said enclosure substantially free of said photoabsorbing species.

6. The beam parameter monitoring unit of Claim 1, wherein said uncoated beam splitter is disposed along an optical path of said output beam from said laser resonator and transmits a substantial portion of light incident thereon for permitting said transmitted substantial portion to propagate toward an application process while said detector monitors said at least one parameter of said output beam by detecting said beam portion reflected by said uncoated beam splitter.

7. The beam parameter monitoring unit of Claim 1, wherein said detector is a photodiode detector including platinum silicide for reducing radiation exposure induced instability of said detector.

8. The beam parameter monitoring unit of Claim 1, wherein said laser is a molecular fluorine laser that further produces visible radiation, said unit further comprising means optically disposed between said resonator and said detector for separating said visible radiation from 157 nm radiation emitted from the molecular fluorine laser.

9. The beam parameter monitoring unit of Claim 8, wherein said separating means includes a dispersion prism.

10. The beam parameter monitoring unit of Claim 8, wherein said separating means includes an optical element selected from the group of optical elements consisting of a dispersion prism, a dichroic mirror, a holographic beam sampler and a diffraction grating.

11. The beam parameter monitoring unit of Claim 1, wherein said beam

path enclosure comprises one or more ports for purging said beam path enclosure with an inert gas to maintain said enclosure substantially free of said photoabsorbing species.

12. A beam parameter monitoring unit for coupling with a molecular fluorine (F_2) or ArF laser resonator that produces an output beam having a wavelength below 200 nm, comprising:

a beam splitter disposed to separate said output beam into a first component and a second component, said first component being used for processing a workpiece;

a detector including a platinum silicide window for measuring at least one optical parameter of the second component of said output beam after said beam splitter, said platinum silicide window for reducing sub-200 nm radiation exposure induced instability of said detector; and

a beam path enclosure containing said beam splitter and having an interior prepared such that an optical path of said second component of said output beam through said enclosure from said laser resonator to said detector via said beam splitter is substantially free of sub-200 nm photoabsorbing species so that said second component reaches said detector without substantial attenuation from said photoabsorbing species.

13. The beam parameter monitoring unit of Claim 12, wherein said detector is disposed within a detector enclosure that is sealably coupled with said beam path enclosure for maintaining an interior of said detector enclosure substantially free of said photoabsorbing species.

14. The beam parameter monitoring unit of Claim 13, wherein said detector enclosure comprises one or more ports for purging said detector enclosure with an inert gas to maintain said enclosure substantially free of said photoabsorbing species.

15. The beam parameter monitoring unit of Claim 12, wherein said laser is a molecular fluorine laser that further produces visible radiation, said unit further comprising means disposed between said resonator and said detector for separating said visible radiation from said 157 nm radiation.

16. The beam parameter monitoring unit of Claim 15, wherein said separating means includes a dispersion prism.

17. The beam parameter monitoring unit of Claim 15, wherein said separating means includes an optical element selected from the group of optical elements consisting of a dispersion prism, a dichroic mirror, a holographic beam sampler and a diffraction grating.

18. The beam parameter monitoring unit of Claim 12, wherein said beam path enclosure comprises one or more ports for purging said beam path enclosure with an inert gas to maintain said enclosure substantially free of said sub-200 nm photoabsorbing species.

19. A beam parameter monitoring unit for coupling with a molecular fluorine (F_2) laser resonator that produces an output beam having a wavelength around 157 nm, comprising:

a beam splitter disposed to separate said output beam into a first component and a second component, said first component being used for processing a workpiece;

a detector including platinum silicide for measuring at least one optical parameter of the second component of said output beam after said beam splitter, said platinum silicide being used for reducing VUV radiation exposure induced instability of said detector; and

a beam path enclosure containing said beam splitter and having an interior prepared such that an optical path of said second component of said output beam through said enclosure from said laser resonator to said detector via said beam splitter is substantially free of VUV photoabsorbing species so that

said second component reaches said detector without substantial attenuation from said photoabsorbing species.

20. The beam parameter monitoring unit of Claim 19, wherein said detector is disposed within a detector enclosure that is sealably coupled with said beam path enclosure for maintaining an interior of said detector enclosure substantially free of said photoabsorbing species.

21. The beam parameter monitoring unit of Claim 20, wherein said detector enclosure comprises one or more ports for purging said detector enclosure with an inert gas to maintain said enclosure substantially free of said VUV photoabsorbing species.

22. The beam parameter monitoring unit of Claim 19, wherein said molecular fluorine laser further produces visible radiation, said unit further comprising means disposed between said resonator and said detector for separating said visible radiation from said 157 nm radiation.

23. The beam parameter monitoring unit of Claim 22, wherein said separating means includes a dispersion prism.

24. The beam parameter monitoring unit of Claim 22, wherein said separating means includes an optical element selected from the group of optical elements consisting of a dispersion prism, a dichroic mirror, a holographic beam sampler and a diffraction grating.

25. The beam parameter monitoring unit of Claim 19, wherein said beam path enclosure comprises one or more ports for purging said beam path enclosure with an inert gas to maintain said enclosure substantially free of said VUV photoabsorbing species.

26. A beam parameter monitoring unit for coupling with an argon fluoride (ArF) excimer laser resonator that produces an output beam having a wavelength around 193 nm, comprising:

a beam splitter disposed to separate said output beam into a first component and a second component, said first component being used for processing a workpiece;

a detector including platinum silicide for measuring at least one optical parameter of the second component of said output beam after said beam splitter, said platinum silicide being used for reducing 193 nm radiation exposure induced instability of said detector; and

a beam path enclosure containing said beam splitter and having an interior prepared such that an optical path of said second component of said output beam through said enclosure from said laser resonator to said detector via said beam splitter is substantially free of 193 nm photoabsorbing species so that said second component reaches said detector without substantial attenuation from said photoabsorbing species.

27. The beam parameter monitoring unit of Claim 26, wherein said detector is disposed within a detector enclosure that is sealably coupled with said beam path enclosure for maintaining an interior of said detector enclosure substantially free of said photoabsorbing species.

28. The beam parameter monitoring unit of Claim 27, wherein said detector enclosure comprises one or more ports for purging said detector enclosure with an inert gas to maintain said enclosure substantially free of said 193 nm photoabsorbing species.

29. The beam parameter monitoring unit of Claim 26, wherein said beam path enclosure comprises one or more ports for purging said beam path enclosure with an inert gas to maintain said enclosure substantially free of said 193 nm photoabsorbing species.

30. A beam parameter monitoring unit for coupling with a molecular fluorine (F_2) laser resonator emitting around 157 nm, comprising:

a detector including platinum silicide for measuring at least one optical parameter of a first beam of 157 nm radiation emitted from said laser, said platinum silicide being used for reducing VUV radiation exposure induced instability of said detector; and

a beam path enclosure having an interior prepared such that an optical path of said first beam through said enclosure from said laser resonator to said detector is substantially free of VUV photoabsorbing species so that said first beam reaches said detector without substantial attenuation from said photoabsorbing species, and

wherein a second beam of 157 nm radiation emitted from said laser is used for processing a workpiece while said detector measures said at least one optical parameter of said first beam.

31. The beam parameter monitoring unit of Claim 30, wherein said detector is disposed within a detector enclosure that is sealably coupled with said beam path enclosure for maintaining an interior of said detector enclosure substantially free of said VUV photoabsorbing species.

32. The beam parameter monitoring unit of Claim 31, wherein said detector enclosure comprises one or more ports for purging said detector enclosure with an inert gas to maintain said enclosure substantially free of said VUV photoabsorbing species.

33. The beam parameter monitoring unit of Claim 30, wherein said molecular fluorine laser further produces visible radiation, said unit further comprising means disposed between said resonator and said detector for separating said visible radiation from said 157 nm radiation.

34. The beam parameter monitoring unit of Claim 33, wherein said separating means includes a dispersion prism.

35. The beam parameter monitoring unit of Claim 33, wherein said separating means includes an optical element selected from the group of optical elements consisting of a dispersion prism, a dichroic mirror, a holographic beam sampler and a diffraction grating.

36. The beam parameter monitoring unit of Claim 30, wherein said beam path enclosure comprises one or more ports for purging said beam path enclosure with an inert gas to maintain said enclosure substantially free of said VUV photoabsorbing species.

37. A beam parameter monitoring unit for coupling with an argon fluoride (ArF) excimer laser resonator emitting around 193 nm, comprising:

a detector including platinum silicide for measuring at least one optical parameter of a first beam of 193 nm radiation emitted from said laser, said platinum silicide being used for reducing 193 nm radiation exposure induced instability of said detector; and

a beam path enclosure having an interior prepared such that an optical path of said first beam through said enclosure from said laser resonator to said detector is substantially free of 193 nm photoabsorbing species so that said first beam reaches said detector without substantial attenuation from said photoabsorbing species, and

wherein a second beam of 193 nm radiation emitted from said laser is used for processing a workpiece while said detector measures said at least one optical parameter of said first beam.

38. The beam parameter monitoring unit of Claim 37, wherein said detector is disposed within a detector enclosure that is sealably coupled with said beam path enclosure for maintaining an interior of said detector enclosure substantially free of said 193 nm photoabsorbing species.

39. The beam parameter monitoring unit of Claim 38, wherein said detector enclosure comprises one or more ports for purging said detector enclosure with an inert gas to maintain said enclosure substantially free of said 193 nm photoabsorbing species.

40. The beam parameter monitoring unit of Claim 37, wherein said beam path enclosure comprises one or more ports for purging said beam path enclosure with an inert gas to maintain said enclosure substantially free of said 193 nm photoabsorbing species.

41. A beam parameter monitoring unit for coupling with a molecular fluorine (F_2) laser resonator emitting around 157 nm, comprising:

a detector for measuring at least one optical parameter of a first beam of 157 nm radiation emitted from said laser;

a beam path enclosure having an interior prepared such that an optical path of said first beam through said enclosure from said laser resonator to said detector is substantially free of VUV photoabsorbing species so that said first beam reaches said detector without substantial attenuation from said photoabsorbing species; and

means disposed between said resonator and said detector for separating said visible radiation from said 157 nm radiation, and

wherein a second beam of 157 nm radiation emitted from said laser is used for processing a workpiece while said detector measures said at least one optical parameter of said first beam.

42. The beam parameter monitoring unit of Claim 41, wherein said separating means includes a dispersion prism.

43. The beam parameter monitoring unit of Claim 41, wherein said separating means includes an optical element selected from the group of optical elements consisting of a dispersion prism, a dichroic mirror, a holographic beam sampler and a diffraction grating.

44. The beam parameter monitoring unit of Claim 41, wherein said detector is disposed within a detector enclosure that is sealably coupled with said beam path enclosure for maintaining an interior of said detector enclosure substantially free of said VUV photoabsorbing species.

45. The beam parameter monitoring unit of Claim 44, wherein said detector enclosure comprises one or more ports for purging said detector enclosure with an inert gas to maintain said enclosure substantially free of said VUV photoabsorbing species.

46. The beam parameter monitoring unit of Claim 41, wherein said beam path enclosure comprises one or more ports for purging said beam path enclosure with an inert gas to maintain said enclosure substantially free of said VUV photoabsorbing species.

47. A beam parameter monitoring unit for coupling with a molecular fluorine (F_2) or ArF laser resonator emitting a beam having a wavelength less than 200 nm, comprising:

a detector for measuring at least one optical parameter of a first beam of radiation emitted from said laser;

a beam path enclosure including one or more ports for purging said beam path enclosure including an optical path for said first beam from said resonator to said detector with an inert gas to maintain said enclosure substantially free of VUV photoabsorbing species so that said first beam reaches said detector without substantial attenuation from said photoabsorbing species; and

wherein a second beam of radiation emitted from said laser is used for processing a workpiece while said detector measures said at least one optical parameter of said first beam.

48. The beam parameter monitoring unit of Claim 47, wherein said detector is disposed within a detector enclosure that is sealably coupled with said beam path enclosure for maintaining an interior of said detector enclosure substantially free of said photoabsorbing species.

49. The beam parameter monitoring unit of Claim 48, wherein said detector enclosure comprises one or more ports for purging said detector enclosure with an inert gas to maintain said enclosure substantially free of said photoabsorbing species.

50. A molecular fluorine (F_2) or ArF laser system, comprising:

a discharge chamber filled with a laser gas including molecular fluorine and a buffer gas;

a plurality of electrodes in the discharge chamber connected to a discharge circuit for energizing the laser gas;

a resonator having the discharge chamber therein for generating an output beam;

a beam parameter monitoring unit as in any of Claims 1, 12 or 47.

51. A molecular fluorine (F_2) laser system, comprising:

a discharge chamber filled with a laser gas including molecular fluorine and a buffer gas;

a plurality of electrodes in the discharge chamber connected to a discharge circuit for energizing the laser gas;

a resonator having the discharge chamber therein for generating an output beam;

a beam parameter monitoring unit as in any of Claims 19 or 30.

52. An ArF laser system, comprising:

a discharge chamber filled with a laser gas including molecular fluorine, argon and a buffer gas;

a plurality of electrodes in the discharge chamber connected to a discharge circuit for energizing the laser gas;

a resonator having the discharge chamber therein for generating an output beam;

a beam parameter monitoring unit as in any of Claims 26 or 37.